

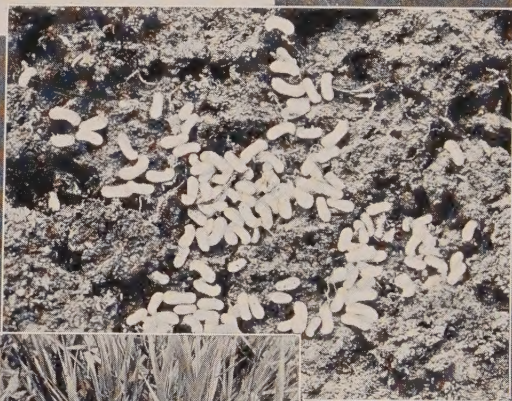
WONDERS OF THE WOODS

J.H.CRABTREE



Digitized by the Internet Archive
in 2025

WONDERS OF THE WOODS



A WOOD-ANT (enlarged).

LARVÆ OF WOOD ANT.

AN ANT-HILL.

'Nature's Wonders' Series

Wonders of the Woods

BY

J. H. CRABTREE, F.R.P.S.

AUTHOR OF

'CAMERA WORK,' 'BRITISH FUNGI,' 'BRITISH FERNS,'
'GRASSES AND RUSHES,' ETC., ETC.

LONDON

THE EPWORTH PRESS

J. ALFRED SHARP

First Edition, 1924

Made and Printed in Great Britain. C. TINLING & Co., LTD.,
53, Victoria Street, Liverpool, and at London and Prescott.

INTRODUCTION

Go where we will, on Britain's Isle, no place is likely to produce so many revelations of Nature's secrets as the woodland glade. With its grasses and their flowers—all very peculiar, its trees and their fruits, its carpet of wild plants and their blooms, its myriad of insects—winged and wingless, its bevy of butterflies and moths, its hidden millions in the pond, pool and stream, its charming pictures of green bracken and fern, its sweet songsters and silent burrowers—what a host of wonderful things! Even the snows and icicles of winter make pretty pictures in the woods.

Wherever and whenever we are privileged to enjoy these woodland scenes let us cherish the opportunity.

J. H. C.

CONTENTS

CHAP.	PAGE
I. SOME WONDERFUL WORKERS—THE WOOD- ANTS	9
II. REVELATIONS OF A WOODLAND POOL .	21
III. COLOURED PLANTS WITHOUT FLOWERS .	31
IV. HOMES IN OAK-TREES	40
V. GREAT TREES AND THEIR STORY . .	50
VI. WHAT THE STORM DID	59
VII. WOODLAND FLOWERS, CURIOUS AND BEAUTIFUL	65
VIII. WOOD CARVERS, BORERS AND MINERS .	74
IX. WOODLAND ARCHITECTS AND BUILDERS .	83
X. JACK FROST IN THE WOODS . . .	92

I

SOME WONDERFUL WORKERS

NEVER before had we seen such a scramble in such a lively crowd. This way and that way, over and under each other, towards home and away from home, every one in the crowd was on the move; and some were helping each other right bravely to get along. What had happened? Nothing very curious. Jennie, who was keen on looking out secrets in the woods, had merely lifted a flat stone which might have lain there unmoved for ten or twenty years. It was embedded in the soil, and had pretty green blades growing all round and over it. We might pass such flat stones by the hundred in or out of the woods, and never think of any great secret hidden beneath.

But Jennie had lifted stones before, and was inspired with the thought that, as beforetime, there might be something wonderful to discover. So there was. Such a crowd of wood-ants that

we were baffled as to where they could have come from. There were hundreds; so busy, so interesting, so intelligent. A wise man once said: 'There are four things that are little upon the earth, but they are exceeding wise.' Of these 'little things' ants are first mentioned as being 'not strong; yet they prepare their meat in the summer.' Lord Avebury (Sir John Lubbock) spent many happy hours in observing ants and their wonderful ways. After most patient watching and noting, he came to the conclusion that 'ants have a fair claim in intelligence to rank next to man.'

Ants, of different types, in different continents and countries, do such marvellous things that belief in their amazing deeds would hardly be possible if they had not been seen by human eyes and noted by human hands. They build houses adapted to their peculiar style of living, with chambers large enough to hold hundreds, and passages allowing at least two to pass each other; they dig mines and devious channels, clearing away the débris without light or leading; they scour fields and meadows for grass, hay, corn, sticks and bits of paper to construct their houses, one to two or three hundred ants helping each other bravely to accomplish a huge task. Some

are diggers, miners and excavators, shovelling aside with strong claws and leathery mandibles the soil and sand, and coating the walls with paper, sticks and clay, to ensure safety and stability. Some are the 'hodmen' of the colony, carrying building materials to the scene of operations below ground. Thus the delving and building go on, until the house is well provided with chambers and channels to accommodate any number from 100 to 1,000.

In hot countries about the Equator, ants perform feats utterly unknown to our British species. By clinging to each other's limbs and bodies, they form long bridges over waters wide, deep and turbulent. Travellers on South American rivers often meet with ant-bridges over which the ants form a continuous procession from one river-bank to the other. When the purpose of the bridge is accomplished, and all the tiny creatures have passed over, the terminal ants 'let go,' and the whole 'bridge' sways in the breeze to the further side of the river where the ants continue their journey. Where a bridge is impossible, owing to lack of trees, the ants burrow beneath the river-bank and delve right down under the river-bed, emerging ten or a dozen yards from the water into full daylight on

the other side. In Africa, white ants build pyramids large enough to house wild beasts of the forest and the desert. The Ardvaark of the South African veldt is extremely fond of adopting an ant's nest for his home and family. Surely, there is no limit to the strange doings of the ant-world.

The ants with which we are most familiar in this country are termed Wood Ants, Horse Ants or Hill Ants. Each name has a definite meaning. These insects live and multiply in woodlands or bushy pastures; they are the largest of our native species; and they make their homes in small mounds or ant-hills. Wood-ants gather together in crowds and, if undisturbed, will cling to the same spot year by year. We have known one particular stone lying on the ground to shelter an entire colony of several hundreds for three years in succession. The older ants die away, and the old home is occupied by their offspring. While the ant-hill itself is generally small, and not easy to discover among the grass, the dwelling-place below ground is ample, being three to five times as large as the 'hill.' In this irregular ball, pierced and tunnelled in all directions, the little brown ants are ever on the move, although the passages and cavities are dark as

pitch. The wood-ant will not have skylights to its rooms. In those secret crannies are laid clusters of creamy-white eggs which must not see daylight, and must be protected from storm, rain and flood, as well as from the scorching rays of the sun. The sun's heat would shrivel them before they could hatch.

The Ant family has males, females or queens, and neuters or workers. In this respect it resembles the families of the wasp and bee, except that there are many queens in one colony. With dainty wings that flicker with sunshine, the male ants are abroad early in the season and disappear soon after midsummer. The queens, too, have transparent, fragile wings that reflect the lovely tints of the rainbow when exposed to the sun's rays. For a brief period, the queens skip about in aerial flights over the meadows and bushes, and then settle on the ground never to rise again. They begin house-keeping, delving into the soil under the grass-roots and forming ant-hills. In the dark recesses of the new home, wings would be of no use; they are torn off or dropped, and scattered about the underground channels. The neuters or workers are the real 'gems' of the ant colony. They are wingless throughout their career, and serve the queens

when the male ants have all cleared away, in making a clean, cosy home for a very numerous family. While the queens walk abroad with dignity, and watch the steady growth of the young broods, the workers are ever on the move, giving attention to the eggs and the young mites that have just been hatched. Smaller and more agile than queens, the workers devote their lives to the welfare of the young ants until they are well able to fend for themselves.

Three weeks are occupied in hatching. Then the young ants begin to nibble at the egg-shell, but find this difficult to pierce. If they stay in too long they must surely perish, as fresh air is quite necessary for them when the hatching-time arrives. Ready and willing are the worker-ants on every side; when the shell is nibbled or slightly cut from within, the worker's mandible or its claw is thrust into the tough covering, and the young larva is released. It is stripped clean, carried away to the company of other larvæ, and treated to its first breakfast. As the larvæ are limbless they cannot walk, and must be carried about by the workers from place to place. They are voracious feeders—that is all they can do. With tiny heads and small jaws they never cease

feeding from the moment they leave the shell, unless the workers are quite unable to find food for them; but this very seldom happens. A small army of food-hunters generally keeps the supply well ahead of what is required. Very soon, the young larvæ become quite plump, with bodies many times larger than those of the workers which tend and feed them. Indeed, they should be healthy when provided with sweet honey and nectar from flowers, honey-dew from leaves, and choice morsels of fruit from under the orchard trees. With creamy-white bodies and light-brown heads, they grow and grow for six or seven weeks. A great change now dawns upon these larval ants.

Becoming sleepy and sluggish, they stop feeding and lie limp and inert in a heap within the cavities of the underground home. At this stage the workers can do nothing. From their sleepy attitude the larvæ wake up, and begin spinning a web to cover themselves all over with a bag or cocoon. The delicate threads of the web are closely interwoven with each other and make a soft warm covering. In this white bag the young larva sleeps for three or four weeks, slowly changing every day, developing towards a perfect insect. Now the workers are alert

again. More work is ready for them, hard work and plenty of it. Those pent-up youngsters are in strong bags and want to get out. They cannot get out. Tap, tap, tap, nibble, nibble, nibble; they must come out somehow, or they will die in their own cocoons. Close at hand the workers smartly cut the bags with their claws; out come the young ants to join the great colony, and make it larger than ever. By a curious mistake, the cocoons are commonly known as 'ants' eggs' and are sold as such for feeding fish in the home aquarium. Wood-ants frequently select the decayed trunk of a tree for their settlement instead of building an ant-hill.

With an ant-hill we discovered in a bushy grove an interesting experiment arose. When the crown of the hill was uplifted, very few ants were to be seen. A lower layer of soil revealed many more; they were removing the larvæ as quickly as possible to safe and dark quarters. One cluster of larvæ was separated from the rest, and covered with a small tin canister. For a few moments we watched events. Outside the box every young larva was carried out of sight into lower chambers; not a single creamy-white speck could be seen. The worker ants were extremely busy. A dozen of them came to the tin box; no way in.

This seemed quite clear to them. They tapped the box with their claws, rubbed it with their heads and mandibles, scrambled over it, stopped short and became furious. No matter—there was no admission. But they meant to get at those larvæ inside, and drew themselves up on the soil alongside the box. ‘Ready,’ and they delved with might and main under the box side until every worker had found admission and rescued the larvæ within—every one of them. It was a wonderful performance. Can ants think? We wondered.

Ants never need ramble far in search of food. Their home is located in a good food area, and they seem to know the exact spot where regular supplies can be found. One of the peculiar habits of wood-ants is their manner of milking aphides or ‘green flies.’ In the summer season these reach millions in number, and abound on the growing-points of flowering plants, ferns and bushes. Ants, apparently quite aware of their sweet juices, climb the plants, and draw from their two body-tubes the sugary nectar. Not the least resistance is offered by the placid aphides. More than that, ants show a wonderful capacity for collecting the eggs of aphides, transferring them to their underground cells, and tending

them with every care until hatching-time. The ants' 'cows,' as they are termed, are milked regularly by the foster-mothers. Insects in the soil dare not trouble the ants' 'farm' where the 'cows' are carefully herded.

Although ants of the woodland live most of their time in dark channels underground where seeing is hardly possible, they have eyes in abundance and can see remarkably well. In front of the ant's forehead are three simple eyes arranged like a triangle; on each side of the head are compound eyes, each containing from 700 to 1,200 facets. The antennæ, or feelers, are continually bristling about and, divided into 12 segments, allow easy and quick movement when finding the way or testing food. When cold or wet nights come to the ants' home, the food-carriers are exceptionally busy. All food is brought indoors; no journeys are made during rain and storm. The food-bearers store up the supplies, and help the worker-ants to cleanse the home and feed the young. Every doorway is sealed with grass, leaves or paper, so that no enemy may enter under cover of night, and sentinels are placed within to give warning of the approach of hidden foes. Ground insects frequently try to invade the ants' home. If an

enemy should perchance get within the threshold, a crowd of ants is mustered, the invader is surrounded and bundled out without mercy. If a struggle ensues, the invader is invariably killed and thrust beyond the bounds of the ants' strict preserve. By sheer force of numbers, the ants are more than a match for a common enemy.

One outstanding feature of wood-ants is this—cleanliness. Dirt in any form is abhorrent to them. Every passage and every cavity of the ants' home is scrubbed regularly with a hundred tiny claws. The 'hill' itself shows what great power lies behind these implements. No taint of any kind is allowed to spoil the comfort of the young broods; among these the queens are constantly ambling and silently directing the workers. In that precious little home under the mound, every creature is doing its duty for the good of all. As we watch their movements under cover, it becomes more obvious that their chief joy is to help one another. It is often urged that ants are awkward stingers. Wood-ants do *not* sting. Some other British ants do sting; but their sting is perfectly harmless, and is only a natural means of self-protection. Ants desire to live at peace with every living thing.

In Great Britain, at least thirty species of ants

have been found. In southern climes over a thousand kinds have been recorded. British ants live longer than is usually supposed. Workers and queens live much beyond the allotted span of males. Marked specimens kept under observation have lived from five to six years. In winter, ants dig deeper into the soil, and sleep during the period of frost and snow.

II

REVELATIONS OF A WOODLAND POOL

MIND the pond—the shallow pool that has been undisturbed for a week in warm weather. Its revelations are wonderful to behold. But how shall we see them? That is a simple matter. Obtain a glass jar with a wide rim—a jam jar will do very well—and tie round the rim five or six yards of strong cord. Keeping quite clear of the water's edge, fling the jar into the middle of the pond, taking special care to hold the free end of the cord by the other hand or round the wrist. If jar and cord both go, it is not always easy to recover them. The free end may also be fastened in a coat button-hole leaving both hands free. Let the jar sink right to the bottom of the pool and remain there for a few minutes. Now pull steadily; not too hard, or the softened wet cord may snap and all is lost. We cannot borrow fresh jars a long way from home. Draw out gently. The weeds will offer great resistance,

and the jar and its contents must be carefully drawn through them. When free from the weeds, the jar is easily pulled to the bank, and lifted up to sunlight for examination. At first, the contents appear to be only muddy water with a few water-plants straggling about. Perhaps a small water-beetle will clamber about the side of the jar, or a water-boatman may be skipping near the surface of the water. Let the jar stand on a stone, a tree trunk or an adjoining wall for a few minutes until the muddy deposit settles to the bottom and the water becomes fairly clear.

Now we can see something very small, but very lively. More and more, as we watch carefully. Here is something jumping with smart spurts; there is a very little creature wriggling to and fro like a squirming adder. But we cannot, with unaided eyesight, observe the details of these small creatures. Cover the jar with care, so that the contents may be kept intact until we reach home. Then empty the jar into a small glass tank or vessel, and take down the microscope for an hour's interesting entertainment. A few slide-glasses, 3-inch by 1-inch, will be required, and a glass tube about 6 inches long to dip into the water jar for 'drops.' Place the tube into the water, block up the free end

of the tube with the finger-tip, and any number of drops may be secured from any part of the water.

What we may find will depend on the locality of the pond, to a large degree, and on our own patience. Probably we shall soon find some very small forms of life called *diatoms*. These abound in most pools of water that are undisturbed, and under a 1-inch or a $\frac{1}{2}$ -inch objective look remarkably pretty. Diatoms are small plants wrapped in flint casings of flat, curved, round, oblong and other shapes. These casings are marked with hundreds of lines, and are pierced by hundreds of tiny apertures. Through these apertures the plant thrusts tiny hairs, finer than the finest cobweb, into the water to get its food. The plant also makes the shell-case from material in the water. In some parts of Denmark, diatoms were once so numerous that their shells now form several feet of solid rock—all made by diatoms, each too small to be seen by the naked eye.

Among these diatoms are seen floating little specks of green—the colour of grass in early summer. These are *desmids*. Some are oval and longer than others, some are club-shaped. Only the largest can be seen without microscope; but

a two-inch objective will reveal the secrets of most desmids. The oval-shaped specimens are very beautiful, with fringed edges and bodies quite transparent. In the water, a desmid will sometimes divide and become two perfect desmids. They have soft coverings, not hard shells like diatoms, and so are able to alter their shape several times in a few minutes. In the bed of a pool they abound in hundreds. The largest desmids are about one-fiftieth of an inch in length!

We have often seen that green slimy stuff which floats on the surface of the pool. How it grows, day by day, in the summer time until the whole of the water is completely covered from bank to bank! It is composed of different plants which live only in stagnant pools. Duck-weeds are among them, and are easily noticed by their two leaves to each plant and a tiny white rootlet dipping into the water. These plants sometimes cover one-half the surface. The green slime is called 'Conferva,' and grows very rapidly on the surface of all ponds during the warm days of summer. It forms a complete shelter, for hosts of living creatures, from the strong rays of the sun. It also provides abundant food for the inhabitants of the pond.

REVELATIONS OF A WOODLAND POOL 25

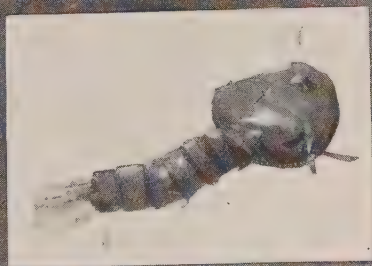
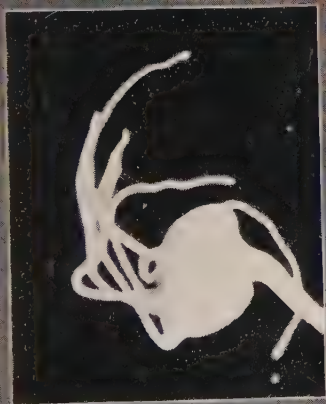
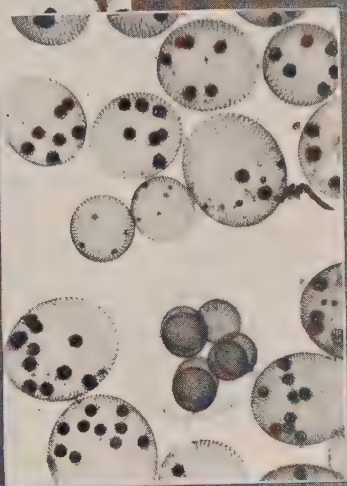
Perhaps the most charming of these microscopic plants in the pool is the *Volvox*, a pretty green round ball about one-fiftieth of an inch in diameter, which is seen rolling about of its own accord by means of tiny hairs thrust through a soft slender covering. Thousands of volvox are to be found in nearly all stagnant pools, floating about and tumbling over each other. Each volvox contains five to eight other volvoces, which, as they grow, burst the original ball and float about for themselves. Volvox will not live in the home aquarium or tank; it loves the open pool and thrives best with plenty of room. Winter has no terrors for volvox; if locked up in ice, it will live to see the spring-time.

In this water from the pool we have the first type of animal life, known as the *Amœba*. It may be seen under a 1-inch objective, tumbling about in the water-drop, a curious jelly-like mass in a transparent cover. It has neither mouth, head, eyes, limbs nor tail; yet it moves about of its own accord, stretches out long points for limbs, closes over diatoms, desmids and other tiny creatures, devouring their soft parts and throwing away the remainder. Like desmids they sometimes divide in two parts, each part acting as a perfect amœba. It varies in size from

1-thousandth to 1-hundredth of an inch, assuming all sorts of shapes. When disturbed, it rolls itself up like a round ball.

Quite a large number of fairylike, wriggling creatures are found in every pool. Termed 'infusorians,' they are remarkable members of the great animal kingdom, and could only be seen at their best through the microscopic lens. Placed side by side, 500 to 1,000 would be required to extend over one inch. They are very delicate, transparent beings covered with hairs that are continually quivering and helping the creatures to skim about in the water. Some are slipper-shaped, and move slowly among the weeds from which they get their food. Some have feet, like suckers, fastened to duck-weeds and conferva, and by means of a fine spiral stem extend into the water a bell-shaped mouth fringed with hairs that are ever on the move, sweeping food into the mouth of the infusorian. These bell-shaped creatures are called Vorticella; if disturbed by a pen-nib, or shaken under the microscope, they curl up the stem and suddenly draw in the 'bell.'

More fascinating still is the fresh-water hydra, of which thousands live in the stagnant pond. This is green in colour, with four to six long



GERRIS FLOATING.

VOLVOX GLOBATOR.

HYDRA AFTER A MEAL.

PUPA OF GNAT.

REVELATIONS OF A WOODLAND POOL 27

tentacles or feelers, which are cast abroad in the water to 'fish' for food, such as water-fleas and rotifers. From these feelers the hydra can send forth poisonous darts which stun its prey at one stroke. The victim is then closed over by the hydra's feelers, much as a spider closes over a fly with its webbing. If a water-flea be the unfortunate victim, it is thrust through the wide mouth of the hydra and swallowed whole. The wily captor then settles down to sleep for a while. Such a dinner will serve for a day or two. Hydras form 'buds' on their bodies; from these come fully-developed hydras which break away from the parents when able to look after themselves. Worms are common in the silt at the bottom of the pool. White and grey worms generally remain in their lowly bed, but the red worms, known as 'blood-worms,' wriggle about in all parts of the pool, occasionally coming to the surface, and lodging there on the duck-weeds or other plants. We have seen 10 to 15 clustered together. Flat worms are also very common, riding over stones and pebbles near the banks of the pool.

Leeches — mostly horse-leeches — are easily detected about the pond-weeds to which their suckers are attached. The leech bears a sucker

disc at each end of its body. By means of its suckers the animal leaps from weed to weed, much after the style of a looper caterpillar on a plant stem. Greenish-black in colour, the leech has eight to ten simple eyes, which, in clear water, easily find suitable food. The mouth sucker at once darts for its prey and a set of powerful teeth are set to work. Like an earth-worm, the leech has its body divided into rings, so that it can move rapidly in any direction.

Among the smaller inhabitants of the pool are the *Cypris* and the *Cyclops*. The *Cypris* is enclosed in two clear shells, formed like those of a cockle or mussel. Its body is fixed to these shells, which, when open, allow the animal to use its four limbs and four feelers in moving slowly about the water. The *Cypris* has only one eye—a brilliant red. It lays about 20 eggs in the season, on pond-weeds and pebbles. The *Cyclops* is larger and more interesting. Female cyclops are more numerous than males, and may often be found in the microscopic 'drop,' skipping and darting hither and thither. A single brilliant red eye is set in the middle of the forehead to detect, at once, the approach of danger. The female cyclops carries on each side an egg-bag containing from 20 to 50 eggs; the bags burst

at hatching-time, setting free a crowd of tiny cyclops. They are very little like the parent. As a rule, cyclops have two long and two short feelers, and two tails ending in tufts of sharp hairs. Watch the cyclops under the microscope.

Water-fleas are so small and transparent that they generally escape notice. Under the lens they cannot. The water-flea, unlike the cypris and cyclops, has a compound eye with 20 to 30 facets in the centre of its forehead, and is clad in a pair of transparent shells. It is a wonderful jumper, darting to and fro in the water at a rapid rate, although only one-tenth of an inch in length. It abounds in the pool during the summer months, and may occasionally be found during the months of December and January. In searching for water-fleas, the pond-jar must be well launched into the deepest parts of the pool.

We could not omit seeing the gerris floating, the water-boatman and the water-beetle, as they are frequently coming to the surface of the water to 'breathe.' Under the wing-covers they capture a bubble of air at the water surface, and swim about until this air is exhausted. They then appear at the surface again to repeat the operation. Neither can live without fresh air. Bubbles

of jelly will appear in the pool in February and March. These we at once recognize as the eggs of the toad or the frog. Another month, and the pool is swarming with tadpoles.

III

COLOURED PLANTS WITHOUT FLOWERS

IN the autumn of every year, when the auburn leaves are floating with the breeze and covering the woodland glade to the depth of several inches, a new type of plant is peeping through the green blades. Displaying all the colours of the rainbow—yellow, brown, orange, red, purple, blue, green and white—they fill the period when nearly all other plants decay and fall. In brilliance, some of them exceed that of our common garden flowers. These curious plants are known as fungi or toadstools. About the months of September and October, when the air is damp and the dew is heavy, there are millions of them in our woods and forests. Some, called ‘mushrooms,’ are good for food, and make very savoury dishes when the cold weather is approaching. Others, however, and especially the more highly-coloured specimens, are poisonous and should be seen only, not handled.

We have noticed, times without number, their pretty caps dotted over the woodland vale and, no doubt, often wondered whence and how they came to be there. No human hand planted them. Nor did they drop from the clouds like rain. [The wind had probably something to do with their planting, for it may have scattered abroad the tiny spores which gave them birth. These spores are so small and numerous that a girl's thimble would hold more than a million. And from these, at one time or another, have sprung all those beautifully-tinted plants which never bear a single flower. Millions upon millions of the spores, like the seeds of wild plants, perish and never take root at all. But a vast number of them settle in the soil, and are watered by the rains and floods. Then they begin to throw out fine, silken roots in all directions, with tiny white knots here and there, throwing out more roots until the sod just beneath is full of white strings which gather up plant-food and produce the coloured toadstools. The rootlets are always white whatever the colour of the plant may be.

We will look at some of these strange plants as they appear in their woodland haunts. Under the birch-trees and firs or pines we find, perhaps,

the most brilliant of them all. In some parts of Great Britain they are very plentiful. Their caps are a glowing scarlet colour, with patches of white scattered over a sticky surface. These toadstools are called 'Fly-caps' because they were used, at one time, for making paste to smear on paper and catch flies, just as we sometimes do now on paper smeared with treacle. But the old custom has died out. It was too risky. These fly-caps are very poisonous, and are best left alone to grow and decay in the woods. At first, they peep through the grass like little red-and-white balls, a few days later we see them fully spreading their round caps glowing with colour. Look at them, but do not touch!

A smoky-grey fungus which abounds in the summer and autumn is called 'Sticky-caps.' It is very slimy and sticky; it does not smell at all nice, although the gills under the caps are a pretty salmon-colour. This, again, must be seen without handling. We should hardly want to touch it. It is nearly always found among dead sticks and fallen leaves.

A fungus which is common in most woodland pastures in late summer has an olive green colour which makes it difficult to find among the

grass. It is known as the 'Verdigris toadstool.' Like the fly-caps, it is bespattered with white specks; the green slowly fades away as it becomes more exposed to the rays of the sun. In damp woods, when overshadowed with trees, the green colour is well maintained and is very pretty. Again, this fungus is sticky and poisonous. It must not be gathered. We have seen many a beautiful picture made by the verdigris fungus in the open field, and in the shady dell. To disturb the toadstools would spoil the picture. All *sticky* toadstools are best left to themselves.

In the woods are plenty of fungi that are not poisonous. The Common Mushroom, for instance, is gathered in loads every year, and much enjoyed as an article of food. In woodland pastures, and the potato fields near the woods, it grows profusely. We could not mistake its smooth white cap and its rosy gills underneath. The stem bears a white frill or ring near the top. This fungus has an agreeable nutty smell when fresh, and may be seen in season, in most green-grocers' shops, offered for sale. In the soil it grows in groups, and makes many a pretty sight among the herbage. A fungus that is frequently gathered when fresh is the 'Shaggy Caps,' found

almost everywhere in the autumn where the grass grows. The cap is tall, round and narrow, like that worn by clowns in a 'show.' It is brownish-white at first, with a brown tip, and slowly breaks up into thin scales which make it look very shaggy. The gills are first light pink—very pretty—then brown and black. At this stage the gills begin to melt, forming good black ink. We have written clear letters with shaggy-caps' ink. When the toadstool reaches melting-point, it is, of course, quite unfit for food. These toadstools sometimes grow in large clusters, with good specimens six to ten inches high.

'Blusher' is a very pleasant name for a fungus which grows plentifully in most fir and pine woods. It has a large round cap of a brick-red colour, and is covered with grey patches or warts arranged in rings. Really, these are parts of the skin, which cover the fungus when quite young and just leaving the soil. As the fungus grows the cap becomes nearly flat; it may often be found four to six inches wide. The flesh of the fungus is, at first, a clean white; but if broken or cut it immediately begins to 'blush' and turn pink. This habit never fails. We may watch it any time in a fresh specimen. Break the stem, and the raw white flesh will 'blush.' Another

pretty toadstool of the leaf-covered woods in autumn is the 'Violet fungus,' so called because every part of it has a violet colour. Cap, gills, stem—all are violet. No other toadstool can be mistaken for it. Lifting its curved head above the brown leaves, it seems to beg for a little more light and sunshine. At Bolton Woods, in Yorkshire, we found it quite plentiful. The cap is about 4 inches wide, being turned up at the edges like the rim of a straw hat.

'Oh! What's that?' shouted someone as we peered over the top of a high wall in Cravenland. Certainly, something quite unusual appeared in the corner of a shrubby field in the near distance. It was apparently round, and about the size of a football, but yellowish-white in colour. We must get a little nearer. Ah, now we see it is a Giant Puff-ball about ten inches in width. It had been quite white earlier, but was now just turning yellow, as it had evidently been growing for several days. Puff-balls do not last long. When white and hard, they are cut into slices and roasted for food. By and by they become soft and flabby, when they become useless for the kitchen, and should be left alone. Inside the strong, leathery skin, millions upon millions of spores are found; these change in



BOLETES.

STICKY CALOCERA ON TREE TRUNK.

SOLDIER FUNGUS GROWING ON A CATERPILLAR.

MOREL.

colour from grey to black when the skin breaks, and the spores are scattered as dust before the wind. At first sight, it really seemed that we could deal with this Puff-ball like a football; but we found it had roots which stuck well to the soil.

Every woodland has its 'Bolets.' These fungi have round caps about the size of an orange cut through the middle. As a rule, they have a deep brown colour, are firm and strong; but instead of having gills underneath, they have a yellow cushion pierced with hundreds of tubes like pinholes. Indeed, the cap very much resembles a small, inverted pincushion. When broken or cut, the flesh is white and does not change its colour. This fungus is used for food when the tubes are stripped away.

Perhaps the choicest and daintiest of the toadstools of the woodland is the 'Morel.' It grows in spring and early summer, and is so distinct and well marked that no mistake can be made with the Morel. About four inches high, it bears a white hollow stem, and a hollow cap much like an inverted peg-top with the sides covered with ridges and network. The Morel smells nice, and tastes well when properly cooked. Morels are not too plentiful or crowded.

One here, another there, and a few yonder are about all you can find, generally. But they show up well just as the 'season' is opening.

About some of the toadstools commonly found in the woods, we should not trouble much. Such, for example, as the common Stink-horn and the Dog Stink-horn would keep us at a respectable distance by their smell, which is not at all pleasant, especially when the caps are covered with flies that sip the jelly until they are really helpless and can neither walk nor fly. These fungi form 'eggs' in the soil with strong leathery 'shells.' The shells burst open, and out come the stink-horns, which grow to perfection in two or three days. The 'Prickly Caps,' too, will not attract us overmuch, as every fungus, in every part, is covered with brown spikes and spines that serve as a refuge for hosts of small insects.

What is remarkable in these flowerless plants is that so many, of *different* colours, grow near each other in the same soil, among the same fallen leaves, under the same trees, and all bring forth their kind to perfection year by year, as the seasons come round. Even the Soldier Fungus does not forget its time of appearance.

As the autumn advances and the caterpillars and pupæ are snugly hidden in the soil, it attacks them, kills them and feeds on them. Its warted caps of brilliant scarlet are seen in October.

IV

HOMES IN OAK-TREES

EVERY oak-tree of the woodland or the forest that has girth enough to fill both our arms at a span becomes, in summer time, the home of thousands of insects. We can hardly touch a single leaf without finding on the underside half-a-dozen aphides or a few stray caterpillars. The sturdy old English oak is so comfortable, and so exactly suitable to the requirements of these little creatures. It shelters them from sudden rain-floods that come with thunderstorms. They cluster together about the leaf-veins, and take no harm, however severe the storm may be; the rain falls away without touching them. Bidding defiance to roars of thunder and flashes of lightning that might make us tremble, they live on, feeding and growing, until the cold snap of late autumn.

Many homes are prepared in the oak-tree long before the frost and snow appear. We see them

at the ends of the twigs like hard wooden marbles; on the roots they appear as hard nuts; on the backs of the leaves they come as yellow, flat discs; and on the leaf-veins as round, green balls. All these are homes in which larvæ are sheltered during the winter. They come this way. Insects, especially saw-flies, settle on the oak-tree, and saw or scratch little cavities here and there. Eggs that no human eye attempts to look for are laid in these holes, which are then carefully sealed over with sticky material produced by the mother-insect herself. In an oak-tree whose age is 100 years or thereabout, homes are provided for over 2,000 insects.

The flowers of an oak are very peculiar. Green like the leaves, they are seen hanging in clusters on thin stalks; quite a host will be found among the higher branches of the tree. Gall-flies are very fond of these flower-clusters, and on the stalks make tiny cuts in which one, two or three eggs are deposited. After covering over the eggs with a sort of 'sealing-wax,' the fly disappears and never sees her mites again. As the autumn advances and Christmas approaches nearer and nearer, the 'cuts' begin to swell, and round 'galls' are formed. The egg within hatches,

and produces a caterpillar which finds plenty of food around it the moment it leaves the egg. Further, as time goes on, the gall keeps growing larger, and grows much *faster* than the larva within. Hence, notwithstanding the severe frost and the snowstorm, the tiny mites never starve. All through the cold months of winter they are constantly feeding and growing. By and by the larva reaches the pupal stage, and eats very little in its dark home. With the coming of spring it has dwelt in darkness long enough. It becomes a perfect insect with wings and limbs like other flying insects. By means of sharp teeth and claws, it bores a hole from the middle of the gall to the outside, and away it flies in perfect liberty.

As with the flowers, so with the leaves of the oak-tree. On the underside we often notice small white, green and red 'marbles,' so pretty and all perfectly round. Generally they are fixed to the strongest veins by a slender stalk. If touched, they drop off. They, too, are galls, due to the cutting of another gall-fly that will have nothing to do with flowers. It prefers the shady side of leaves, and places one egg at every spot where a gall is found. We have sometimes found five or six galls on one leaf, with a small cater-

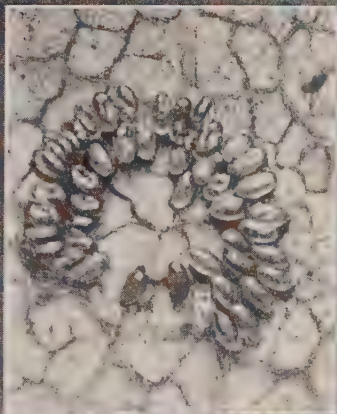
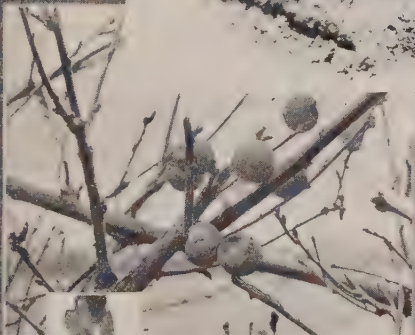
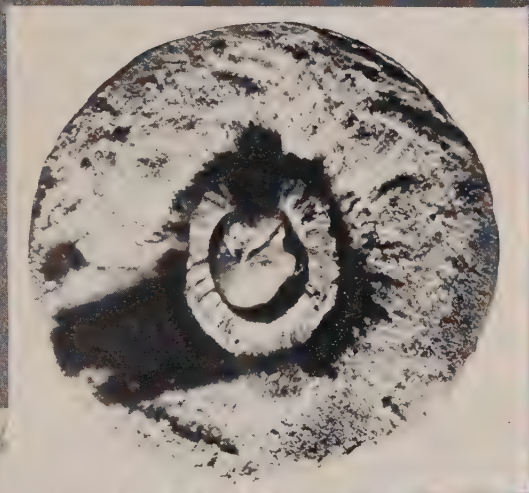
pillar in every one. These leaf-galls fall off very soon owing to wind and rain. But the larvæ still live in them among the grass, and bore through to the sunshine in the early spring. As we walk over the fields and meadows, and through the woods and dells in winter, we seldom think of the millions of living creatures that are growing at our feet. They will show themselves in the coming summer. Very many began their lives on oak-trees.

Large groups of 'oak-apples' appear at the tips of the branches. These are very hard, and may be half-an-inch in width. Again, a small fly is responsible for these. Round as balls, and solid as wood, except at the hollow centre, they show, when the little tenant has escaped, a small aperture which seems too small for an insect to emerge. It does its work all right. In real darkness, the mite bores clean from the centre to the circumference in a straight line.

An insect that lives about the lower part of the oak clings to the rootlets near or on the ground. This fly means business, and lays eggs in the bark of the roots. A larger gall is formed in this instance, not round or oval, but very irregular after the fashion of a hare-nut. The root-gall contains five to ten larvæ snugly housed

for the winter. Every gall is a home with food for the larvæ within, and contains much more than will be required for them up to the time they escape into sunlight. What a wonderful provision Nature makes for the lowliest of her children!

The oak-tree has galls, even more peculiar, growing from the tips of some of its branches. These are called 'artichoke galls' from their resembling the thistle-head coverings of the artichoke plant. This gall comes from the cutting of a certain fly which never creates a round gall. The inner cavity contains two or three larvæ which, in due time, pierce the wall and gain their freedom as perfect flies. Perhaps the disc gall is the most remarkable of all the homes in the old oak-tree. These galls are known as 'oak-spangles,' and are very beautiful when seen under the microscope. They are common in the autumn, and may be seen tacked on to the under-side of a leaf as round flat discs with fringed edges. A white larva lives at the centre of the disc, and slowly grows and grows until it becomes a fully-developed fly. Lifting a slender lid at the proper season, it wings its flight to join the happy host that lives for a few hours in the air.



OAK-APPLE GALL WITH PUPA.

OAK BRANCH GALLS.

MOTH'S EGGS (much enlarged) ON OAK LEAF.

MARBLE GALLS ON OAK LEAVES.

In addition to the vast numbers of insects that are *born* in oak-trees, an immense quantity take refuge or lodge on their leaves and branches. The New Forest, in Hampshire, has many stately oaks growing within its borders. Among them are several which were old oaks long before the Battle of Trafalgar was fought in 1805. In the warm days of summer these oaks are alive with White Admiral butterflies. On trunks and main branches, stag-beetles are found in abundance, although their early home is in the soil. They cling to the oak-tree, and seldom leave it during the brief span of their lives. Where the curled and knotted roots lift themselves from the ground leaving wide openings beneath, larger animals find a home. Swarms of rabbits burrow among the roots, often to a considerable distance underground. Clap your hands in the heart of the woodland, and a host of white tails will make for the nearest oak-trees. Bunny is unfortunately exposed to terrible risks at times; badgers and stoats find the channels among the roots of the oak, tracking the rabbits to the utmost limits of their burrows. These invaders make havoc among the young rabbits in their narrow downy homes. The worst feature of these prowling hunters is their habit of devouring far more than

they need for food. Like tigers, they gloat in killing the innocent little bunnies which are quite unable to help themselves or to escape.

When the rabbits have spent days and weeks in making snug and comfortable homes for their young, Reynard, the fox, appears on the scene, devours the inmates of the burrow and enlarges it to suit his own purposes. The mother-fox comes along and takes possession for her family. Vixen knows well the value of these burrows under sturdy oak-trees. They are much better and safer than holes in hedgerows. Terriers and hunters can pierce the holes in hedgerows; but the hard, strong roots of the oak-trees defy them all. When the fluffy cubs are housed in their chamber at the end of the burrow, no badger, weasel or stoat dares to enter. The risk would be too great. He might not come out alive. Dogs, when hunting, are not always free from mishap. Two kinds of dogs are placed in the field. The hounds are the larger animals with smart heads and eyes; they career over the field at a good pace when the fox is in the open. Terriers are smaller dogs that ferret the foxes out of their holes. In a well-known country pack one of the terriers made for a vixen's burrow,

and got well in under a huge oak-tree. As neither terrier nor vixen came out soon, the watchers at the vent felt anxious as to what had become of the terrier. The fox did not concern them so much as the valuable dog. Wait! Wait! Wait! Still no dog; no fox. What was the matter? The huntsman placed his ear to the mouth of the burrow. He could hear the faint yelping of the dog, and concluded that the terrier must have got wedged fast somewhere. As events proved, the huntsman was right. Forthwith, he called for spades and picks from the nearest farmhouse. The dog must be saved at all costs, and at all hazard. Willing hands were soon ploughing about the roots of the old oak-tree, tearing up vixen's burrow, foot by foot, with amazing speed. Sure enough, the terrier was found as tight as a cork in the burrow, wedged in by one of the roots of the tree. Just in time he was rescued, but was quite exhausted. A few minutes rubbing and caressing brought the terrier round again, after a keen struggle to get at the vixen. She seemed as far away as ever. After more ploughing along the burrow the dogs were called off; but watchers remained in the near distance. Not until the hounds were far away on another track did vixen appear in the

daylight to view the shattered burrow under the oak-tree. Then she and her cubs were quite safe. The roots of the tree afford a measure of safety which is not to be found in a hedgerow with a straight burrow.

Birds make a strong claim on the oak-tree as a refuge and a place for their homes during the nesting-season. In keeping with the size and dignity of the tree, it is generally preferred by the larger species of birds such as the ring-dove, turtle-dove, kestrel, rook and heron. The jackdaw and magpie haunt the highest branches and fix a batch of twigs for their slender nest. The woodpecker, wry-neck, nuthatch and wood owl search out a rusty-looking hole in the trunk and live there, with their young, in a nest at the bottom of the hole. Smaller cavities in the trunk are occupied by the starling, long-tailed tit, spotted fly-catchers, tree-creepers, red-starts and tree-sparrows. What a remarkable colony of interesting creatures live in and under the far-famed British oak-tree! From the hidden rootlets deep below ground-level to the sky-scraping pinnacle, it harbours, feeds and protects the lowly earthworms, centipedes, millepedes, beetles, butterflies and moths, a host of flies of many kinds, birds and bats. The nimble

squirrel, leaping from branch to branch with upturned bushy tail, makes it his favourite roost when the acorns are ripe and ready for collecting to his wintry home.

V

GREAT TREES AND THEIR STORY

SOMEHOW we felt that Jack had sustained a severe fall; but, for a minute or two, we knew not exactly what had happened. He was a smart boy, very fond of climbing tall trees; and we had gone for a day into the heart of the woods to look for suitable twigs of oak. It was 'Sapling Day,' the 29th of May. On Sapling Days it was the custom for every cottage to hang a fresh twig of oak over the front doorway; and it was to be kept there for one whole week. Jack had found a magnificent tree on an upper slope of the woods, and, whatever we said, nothing would dissuade him from getting one or two of those bright green, fresh twigs, right at the crown of the tree. He was plainly told that it was too risky and unsafe; a branch might snap in a moment and let him down twenty feet, at least; and we might have to carry him home on a stretcher made of sticks and our coats. No matter. Jack would

have his way; and he got it. As we surmised, a branch near the tree-top, just as he was grasping the coveted prize, did snap; and down came Jack, heels over head, with one arm across a thick branch, and an awkward thud on the ground. 'Now, Jack; what now?'

He was stunned for a minute. He was a strong boy, and pulled himself up. 'Oh, nothing much wrong,' said Jack. But there *was* something wrong. He could not lift his left arm. It was broken above the wrist. A few wee saplings had been gathered together, but this untoward accident spoilt the 'day.' Jack was remarkably plucky. He was wrapped fairly tight in his coat, with the broken arm carefully protected, and we hurried home. But Jack would have those saplings carried, too. He could walk all right. He still ruled our little party, and was not going home in a hurry without something for his trouble. And so the saplings appeared over the doorways of the cottages as aforetime.

The 'day' was kept and honoured, year by year, in remembrance of Prince Charlie's escape in the oak-tree at Boscobel, in May, 1651, when, pursued by Cromwell's soldiers after the Battle of Worcester, he climbed the 'Royal Oak' and

remained there while Boscobel House was searched through and through for him. From that day onward, the 29th of May was long celebrated in memory of the happy event; and boys of the country indulged in an oak sapling for the home threshold. It brought 'goodwill, good luck, and good health.' The woods were little the poorer for the slight disturbance of the twigs; and farmers generally were quite agreeable to the invasion, coming as it did only once a year. The Royal Oak of Boscobel has vanished. Not an atom is left. For a while it was railed round; the rails were torn away; then a brick wall was built round it, and an inscription with 'letters of gold' was fastened to the wall. Not a scrap remains, but the site is still pointed out where Prince Charles hid for two days among the foliage of an oak-tree, sleeping part of the time with his head on the lap of his friend Captain Carlos, while the soldiers tramping below were thirsting for his capture.

Many trees, equally wonderful in song and story, are still living and flourishing in our woodlands. We strolled into the Kentish Woods about Bromley and Chislehurst, near the brick mansion where Napoleon III spent his last years in exile. Not far away, we came to the hollow



KING HENRY'S OAK—AMPTHILL.
 EMANCIPATION OAK—HOLWOOD, KENT.
 ANCIENT YEW, STYAL. SELLY OAK, BIRMINGHAM.

trunk and wide-spreading boughs of the 'Emancipation Oak.' No rails then surrounded it, to keep away memento-hunters. We could sit comfortably in the hollow of the growing tree. Now, the remnant—plenty of it—is railed round and carefully preserved. Just near the footpath close by is a stone seat whereon is recorded the fact that here William Wilberforce first hinted to William Pitt, then Prime Minister, that he meant to use his utmost power to set free all slaves in British Dominions. Not long after, Wilberforce had the joy of seeing a glorious victory crowning his efforts. The famous oak-tree still stands, weathered, broken, and shattered, but is shedding new life and foliage as the years roll on.

A delightful ramble in Bedfordshire brought us to Ampthill, where 'Henry VIII's Oak' is still growing and spreading its boughs so far that they have to be supported by strong wooden props. It will be remembered that of the queens of Henry VIII the first was Catherine of Arragon, who, enduring many years of trial and difficulty, was sent away from his Castle at Windsor, and provided with a mansion among the Woods of Ampthill. This mansion was long known as Ampthill Towers. To-day not a brick or stone

of it remains. A tall memorial cross with a curious inscription stands on the site, and within a short span is the famous oak-tree which was old in Henry's reign. The King paid many visits to Amptill Towers after the Queen was removed from his Court; and on fine days he could be seen seated under this oak-tree in conversation with the despised Catherine. It was a magnificent tree, and has been well preserved.

At Marton, in Cheshire, we found an enormous tree-trunk—also an oak. The hollow interior had been used as a shippon to hold a cow; from this it had turned to a shelter for the geese of a neighbouring farm. Like many others, the Marton Oak is said to be 'the largest in England.' The Winfarthing Oak, among the woodlands of Norfolk, is twelve centuries old, and contains enough space inside to hold several seats and a table. A local farmer, with an eye to business for a good cause, affixed a brass plate to the doorway with this inscription :

Ye who this venerable oak survey,
Which still survives through many a stormy day,
Deposit here your mite with willing hands,
To spread in foreign climes, through foreign lands,
The Sacred Volume.

The Oak-tree of Boscobel is not the only

Royal Oak, by any means. One very celebrated tree grows in the woods about Hatfield, in Hertfordshire, and is known as 'Elizabeth's Oak.' When the stormy reign of Queen Mary I and Philip of Spain had ended, messengers were sent post haste to Hatfield, where Mary's sister, Elizabeth, was kept under close observation, to tell her that she had become Queen of England. They found her quietly reading a favourite book under the boughs of this oak-tree. She was conveyed to London to hold her first 'Cabinet Council.' There is also another 'Elizabeth's Oak,' connected with royalty, in the forest of Whittlebury, in Northamptonshire. The 'Elizabeth' of this tree was surnamed Woodville; she was a widow with two little boys, whose father had been killed in the Wars of the Roses. Their father was intensely fond of his children, and left them his large estates. The boys, however, had had all their rights taken from them, and the mother—a wise and cautious woman—was anxious to get back her boys' fortune. Elizabeth was fond of rambling in the woods. Many times, with her boys, she strolled abroad through the dense forest, along unbeaten tracks, never fearing that harm might come to them. And when news came that the King

—Edward IV—was to pass through the forest, she determined to ask him to restore her boys' rights to their father's estates.

The King and the pleading mother met under this oak-tree, and held a very pleasant conversation. Edward was impressed with her modest grace and beauty. Not only did he agree to restore her boys' fortune, but he fell in love with the lady herself. Shortly afterwards, the chroniclers wrote these words :—' In most secret manner, upon the 1st of May, 1464, King Edward spoused Elizabeth, which spousales were solemnised early in the morning, at Grafton, near Stoney Stratford.' Thus Elizabeth Woodville became Queen of England by her pleading under the oak-tree.

The 'Rufus Oak' of the New Forest had an awkward story. It was slightly in the way when Sir Walter Tyrell aimed at a stag. King William II was not far away. Sir Walter's arrow glanced against the oak-tree and struck the King. That was a fatal day for William Rufus. The site of the tree is now marked by a huge stone. The 'Abbot's Oak,' at Woburn Abbey, was used as a gallows-tree, whereon the Abbot and several others were hanged for offences which would now seem paltry. Druids of olden times held their

feasts and sacrifices under oak-trees, especially when mistletoe grew on them.

Mistletoe bushes are delightful on bare oak-trees at Christmas when tree-fruits are rare. This plant is a parasite, growing on the bark, and feeding on the juices of the tree. The shining white berries are both pretty and useful over the doorway of a drawing-room at a Christmas party.

Sycamores and ash-trees, yews and beeches, have also their share in our nation's story. The famous 'Monmouth Ash' grew on Sedgemoor when the brief battle was fought by the Duke of Monmouth against his uncle, James II. After the struggle, the Duke was found hiding under the leafy canopy of this ash-tree. Thence he was taken to Whitehall, and to the block. The famous beeches of Burnham Woods have flourished for ages; many are of enormous size and girth. We came upon one of them that measured 16 feet round. Perhaps this was the tree mentioned by the poet, Thomas Gray, as the 'nodding beech that wreathes its old fantastic roots so high.' When he wrote to his friend, Horace Walpole, he said: 'I have at the distance of half-a-mile, a forest all my own, for I spy no human thing in it but myself. Both vale and hill are covered with beeches.'

The 'Martyr's Tree,' at Brentwood, is a flourishing elm, 300 years old, growing on the spot where William Hunter, the youthful martyr, suffered at the stake. In those terrible times it was common for the largest and most magnificent trees to be used as stakes and gallows. To-day, these kings of the forest reign supreme, to gladden the eye, and feed thousands of Nature's lowliest creatures.

VI

WHAT THE STORM DID

THE lightning flashed vividly every few moments; and the thunder rolled with tremendous peals as we sat at Sunday's dinner. It was a most unusual occurrence, following on a sunny morning in the month of July. The window-panes told their story very soon; rain poured down in torrents and the streets flooded rapidly. The wind, too, gathered force and lifted at least one conservatory into the tops of a tall tree. To the old churchyard the foot-track was barred by three huge trunks which had been brought to earth. The storm had no mercy for chimney-pots; these lay in bits on the thoroughfares and byways. Then our eyes lifted towards the distant woodland, where the trees grew on slopes from the dell below to the hill-tops.

What could the storm do in the woods? It is generally thought that where trees and shrubs are planted together in close order they will shelter

each other. So they often do. But such a storm as had just passed over was too much for the woodland trees. A stroll over the hills proved the violence of the storm. The firs, pines and beeches were in the full blast of the wind and rain. One by one, group after group, was seized in the grip of the storm, and thrown over or torn up by the roots. Two or three feet of earth was plucked up as if it had been loose sand on the sea shore. Some two hundred trees fell in the sweep of that storm in this woodland alone. While woods are drenched with rain that does no harm and often much good, storm-winds of great force and strength may uproot the growth of fifty years.

Yonder is another story of the storm. A tall fir-tree has the top lashed away, and the trunk split open to the roots. How has this been done? When a thunder-storm is raging, currents of electricity are streaming from all points of these upland trees. Unseen, but certain, millions of electrical streams are thus passing from earth to air, and from air to earth. Here and there terrible and violent explosions occur in this interchange of electricity, sometimes splitting trees, lopping off branches, and felling the trunks. When forked or curved lightning flashes

over the woods it is pretty sure to do damage somewhere. We have frequently been told that it is risky to shelter under woodland trees during a severe thunder-storm. The reason is not far to seek when we call to mind that, when so taking shelter, we are standing in the track of these electric currents that pass from the thousands of points of the leaves above to the earth beneath.

We often wonder why those sheep, cows and horses were killed in the wood while taking refuge under the spreading foliage of trees. The reason is just the same. They stand or lie in the track of the electric currents, and if these are very strong the animals are killed in just the same way as a man is killed by touching a strongly-charged electric wire. Besides, woodland storms, especially on rising slopes and exposed parts, are more risky than those over open fields and meadows, buildings, streets and squares. A farmer friend with a flock of fine sheep turned them out to pasture in the open meadows. Some of them strayed into a neighbouring wood where the grass was sweet and fresh. A terrific thunder-storm burst over the woodland glade, and a nightfall search found seven valuable animals lifeless under the trees. Horses and cows are affected more than sheep,

as they are generally standing when attacked by the electric current. As a rule, no mark of injury is found on these unfortunate animals. Damp air in the woods, like damp soil or water, readily conveys the unseen current.

On the slopes of Dartmoor, where electric storms are frequent, one such event made havoc of the village church; and the old folks, to this day, tell stories of its effect on the worshippers, of whom over sixty were injured.

Woodland storms do more than uproot trees. Water comes from every quarter into the low-lying woodland dell. Floods pour into its channels with terrific speed, carrying all before them. Sheep and cattle are swirled into the waters and destroyed before reaching firm ground. Insects and larvæ are washed away in thousands. Young trees and rotten trunks are borne afloat on the bosom of the flood, and heaped together at the first bar. Rabbits in their burrows are helpless. Not until the second or third day after can the full effect of the storm be measured. In electric storms, when wind and rain continue at their worst, the air is moving at the rate of 100 miles per hour, or more.

Remarkable as it may seem, great good *may* and often *does* come from woodland storms.



FIRS AND ELMS UPROOTED.
 HOLLY TREES BLOWN DOWN BY STORM.
 A WOODLAND FLOOD AT INGLETON.

Decayed roots and trunks are washed clean away. A myriad of caterpillars, which would destroy plants and leaves, are borne away in the flood; the ground is enriched with fine silt and the seeds of new plants. Hence, in a few weeks, the woodland dell, which was threatened with doom and destruction, 'blossoms again as the rose.' New plants, new blooms, new grasses, new ferns arise everywhere. The dell is greener and fresher than ever before. Pure air fills the woodland from end to end, and every rambler within its borders enjoys the prettier scene and fresher charm.

One such woodland we know well from boyhood. Over the moorlands, two miles away, there came an electric storm and a cloud-burst. The waters of cloud-land met the hazy mist of the moors, and a mighty deluge chased down the moorland slopes at an amazing rate. Wooden planks, loose trees were cleared like matchwood. Two stone bridges were stove in by the force of the flood. The wall of a large mill was broken down, the rooms flooded to a height of nine feet. The waters swept on in the only course possible—towards the woods.

On the threshold of a beautiful dell was a coal-pit shaft, over 60 feet deep, with tunnels at the bottom leading in all directions to the parts

where the miners were hewing coal. The mighty torrent swept on, swelling and leaping in its track. It poured into the deep coal-pit like a miniature Niagara; and so sudden was the fall of water that not a single person below had time to escape.

The flood filled the dell, cleared away the next bridge, and attacked another mill so violently that only one half remained. Then the waters spread over a wider area, and the storm assuaged, leaving in its train a strange scene of devastation. With the loss of human life, losses of horses and cattle, the damage was great; and that once charming woodland glade was reduced to a quagmire covered with silt and dark mud.

We have been there many times since the storm. The old coal-pit revealed its lifeless burthen after the flood subsided, and then closed its doors for ever. The shock was too great. But the dell slowly gathered new life, and is now carpeted with fresh greenery. During the summer it presents many a charming picture of natural beauty such as was never seen before the great storm and flood.

VII

WOODLAND FLOWERS—CURIOUS AND BEAUTIFUL.

FLOWERS in the woods are often much unlike those of the field and the garden. In my early days, the flowers of the Guelder-rose seemed most peculiar. There is little doubt about the flower not resembling an English rose. It is so called from the name given to it in Dutch Guelderland, where it was first cultivated. The creamy-white florets are not really complete flowers, although they are the most charming of the whole group. They have neither pistil nor stamens; and every perfect flower contains both these parts, generally one central pistil and several stamens. The outer petals have none at all, and cannot produce berries in autumn. The smaller flowers inside the creamy ring are all perfect, and have pistil and stamens. The brilliant red berries come from them after the ring florets have died away.

Trees have flowers, as is the case with small

plants. They are not always so brilliant, and in some instances are very curious. Lime-trees have perfect flowers almost as green as the leaves. But the flower stalk is fixed on a broad green bract which keeps the flower firm until the seeds are cast. Also, in every flower the pistil is longer or shorter than the stamens, so that each flower is fertilized from some other flower by the work of bees which swarm on the lime-trees. There is always plenty of sweet nectar for bees and flies in the flowers, and plenty of honey-dew on the leaves.

The beech has two kinds of flowers on one and the same tree—male and female. Male flowers are small and have plenty of stamens; female flowers gather on a hard scaly cap or cushion. By and by this cap splits into four parts, releasing two hard nuts called ‘beech mast.’ A walk through beech woods in the autumn will disclose heaps of mast on the ground and alongside the waterways. The nuts are greedily devoured by squirrels, badgers and other animals that make homes in the woods.

One of our largest and most stately of forest trees—the ‘rugged elm’—bears some of the smallest flowers known. They appear in March in grey clusters, a dozen together, each flower

being less than a quarter of an inch in size. Long before the leaves are seen, these bunches of elm flowers make the huge giant look hoary in the cold March winds. The seeds appear a month later, also in clusters, every seed being held in a flat ring, or samara, so that it can easily float in the breeze and be borne along to suitable soil. Here, then, we have pretty little grey flowers producing seeds with 'wings.' The Common Ash is still more striking with an array of white bunches of flowers, each flower being very small, showing in all parts of the branches long before the leaves appear. Some of the flowers have stamens only, some have pistils only, others have stamens and pistils. The pollen from these flowers blows about in the wind like dust. The seeds are provided with flat 'wings,' and are seen in bunches commonly called 'ash keys.' The little white flowers often produce 40 to 50 'keys' in a bunch.

The Sweet Chestnut is a magnificent tree in our largest woods, and bears flowers—male and female—quite distinct from each other. The male flowers, very small, grow on slender stalks eight to ten inches long. Near the foot of the stalk are two or three female flowers with pistils. The male flowers have thin stamens with tiny

anthers containing pollen. As the seeds grow—generally three together, they are covered with strong capsules and a host of prickly spines. In the Horse Chestnut each flower of the spike is perfect; it has both stamens and pistil. What can be more beautiful than the horse-chestnut blooms in tints snow-white, red and pink, sweet with rich stores of nectar! Their seeds are pent up in hard, thorny, green balls.

Trees of the woodland have ways of their own. Entirely out of the ordinary fashion of flowering, the Yew develops male flowers, little patches of yellow, under its leaves where, in passing the tree, we should scarcely see them. Besides, they happen to come when the weather is the coldest and stormiest—about February and March—when we are not much inclined to go abroad flower-hunting. Still, they are very pretty against the dark green fronds, and well worth looking for on a winter's stroll. Female flowers are quite different and, as a rule, do not grow on the same tree as the male flowers. They want a tree to themselves, and in most woodlands they succeed in getting it. The female flowers are found on the branches, not on the leaves, and contain a dark-green hard berry peeping through a light-green soft cushion. This fleshy rim soon turns a

brilliant scarlet, and the yew-tree looks quite charming in its bright array of red cups. If we handle these cups we must wash our hands before taking dinner or tea. On no account are they to be eaten, although, just when ripe, they have a sweetish taste. They are very sticky, and do not last long when the flies come to them. The red cups make choice food for wasps and blow-flies. When the repast is completed, the berries grow and fall to the ground, bringing forth new plants which may live for 1,000 years or more. Yew-trees are real 'Ancient Britons.' Some are still living in Wales that formed groves for the Druids.

The Silvery Birch is styled 'the lady of the woods' on account of its graceful charm in the summer-time. It bears male flowers in catkins that begin to show themselves in October, and are fully grown in April of the following year. Then a mere touch sends a cloud of fine pollen dust into the air. The male flowers are quite separate from the female flowers; these latter require careful searching. We shall find one here and there by tracing the branches near the tips. Here is one, a small hard patch covered with scales and two or three red pistils coming from the uppermost point. They are as much

unlike flowers as any we can find in the whole woodland. Yet they produce thousands of winged nuts in the autumn; these we find in abundance under the Birch-trees. Witches' brooms on these trees are neither flowers nor fruit. A little gall-mite has upset the proper growth at these parts of the tree, and produced what is really a fungus. 'Witches' had nothing to do with them at any time.

Alders are found by most woodland streams and rivers, especially in the north country. They, too, have strange flowering habits. In September and October the male flowers form small red catkins that look very striking in the waning daylight when nearly all other flowers have withered away. They keep on growing through the cold and stormy winter, reaching perfection about March. Then we can see thousands of them, two inches long, shivering in the breeze on all the upper branches. About this time the female flowers appear in short yellow cones, covered with scales. Both kinds of flowers are separate, but grow on the same tree. When the cone flowers have been fed with pollen dust from the catkins the seeds within enlarge and drop out, so that in September and October we find the scales open and empty. The cones remain on the

tree for another year until new ones appear. On the same tree we often observe new catkins, new cones and old cones, at the same period.

Everybody enjoys a sight of the Hazel in flowering-time. The long, trailing, slender catkins of male flowers are seen to perfection in March and April, when the winds blow the pollen about in clouds. From their striking resemblance to the 'real thing,' they are frequently called 'lambs' tails.' Female flowers are small scaly tufts on the upper branches, with two seeds and two short crimson pistils. These seeds, in the autumn, become the sweet hazelnuts we love so well.

Ground plants of the woodland are not less interesting than those which soar aloft. One of the most peculiar of flowering plants is the Wild Arum, known as 'lords and ladies,' 'cows and calves,' or 'cuckoo pint.' In March and April the Arum is very plentiful in woods that are not too cold and exposed. Quite unique are the flowers; a green covering slowly unrolls and reveals a central stem or 'spadix,' sometimes brown or green, and usually deep violet. This glaring colour and the peculiar smell of the Arum attract a swarm of small flies to the place where the plants grow. In the middle of the

spadix is a ring of hairs which acts much like a mouse-trap. The flies enter the flower-trunk for honey and easily pass this ring, but the hairs being turned down and very strong, the flies cannot get back. They are trapped. Below this ring is another ring of male anthers producing pollen like the flowers of an ordinary plant with stamens. Further down the spadix is a third ring, with female flowers, and seeds that become the brilliant arum berries of autumn. These berries are greedily devoured by the larger birds, but are poisonous to human tastes and should not be handled. They are pretty where they grow, and best left there.

The Woody Nightshade is a trailing plant which should be better known. Many children have been deceived by its brilliant purple blooms and the scarlet berries which cling to the plant after most of the autumn fruits have vanished. The plant is also named 'Bitter-sweet,' owing to the fact that when the roots are tasted they are very bitter at first, and afterwards become quite sweet. Flowers of Woody Nightshade are similar in form to those of the potato, but no mistake can be made if we bear in mind the deep purple of the Nightshade. Another Nightshade often grows plentifully in the woods—Bella-



WILD ARUM.

DEADLY NIGHTSHADE.

BEECH (with male and female flowers).

donna, or Deadly Nightshade. Its flowers are purple, and shaped like bells; from these come sparkling black berries with a purple tinge. The berries are very poisonous and should not be touched. Children have often mistaken them for blackberries of a sweeter sort.

Charming and attractive are the primroses in the woods. Here they grow in abundance and, in spring, brighten and beautify the shady places of the dell. Everyone loves to see the primrose at the dawn of springtime. Thousands are gathered; more remain until the summer is well advanced. The flower is so called from its appearance in the prime or early part of the year. Primroses have, at least, one strange feature. They are of two kinds. One has the stamens higher in the trunk of the yellow flower than the pistil; the other kind has stamens so low that they never reach the pistil. Hence, the pistils have to be fed with pollen by bees and flies passing from one flower to another bearing pollen on their heads and limbs. This is left on the pistils as they pass in and out of the flowers.

VIII

WOOD-CARVERS, BORERS AND MINERS

WE shall have noticed the curious marking on the bare trunks of some woodland trees, particularly the elm, after the bark has been stripped away. It looks as if someone had been attempting to carve a chapter of ancient manuscript, such as is found on old papyrus leaves of the Egyptians who lived 2,000 years ago. The Scolytus or Burrowing Beetle is responsible for this marking. It is a wood-borer with a fondness for the soft bark of the elm. This it pierces when the nesting time is near, and makes a cavity between the trunk and the bark. The hole is lengthened above and below, and eggs are laid along its course from end to end. Then the Scolytus is content. It turns back to the aperture which it made in the bark at first, plugs the hole up with its own body to make sure that no foe shall disturb the eggs, and dies there.

A few days later the eggs hatch, and the young larvæ, which feed on the wood of the tree,

bore away from the middle channel, feeding ravenously as they go. Each larva is provided with a horny tool, like a gimlet, which carves away the wood into sawdust and provides the little grub with a meal. On it goes, day by day, growing as it proceeds and making the tunnel larger. The little creature cannot turn back; the tunnel behind it is too small. Thus it must go forward until fully grown. At the end of its tunnel the larva changes to a pupa and sleeps for a while. When it wakes up it finds itself to be a perfect beetle—a *Scolytus*—with limbs, wings and wing-covers all complete, ready for the fresh air and sunshine. The first business then is to get out of its hole, and this is done in quick time by boring through the bark. The beetles sometimes get astray in their tunnelling and often cross each other's track. If they should happen to meet each other at a crossing, a fierce struggle ensues in the dark channel. The larvæ do not spare one another.

The Stag Beetle is content to bore into the bark of trees such as the oak, elm and beech, for the purpose of placing her eggs. When they hatch, the larvæ mine the trunk in all directions. From being small hunch-backed caterpillars they become large, plump larvæ in channels well filled

with wood dust. For six years the larvæ of the stag-beetle mine the woody portion of the tree and, in that period, never see daylight. At the end of that time they curl up in the tunnels and sleep until completely changed into beetles. Then their way out is made easy by strong biting jaws and rasping tongues. There is no delay in making for the sunshine. Stag-beetles have wings that love to play in the sunlight; and they delight in sipping the sweet juice from the leaves when covered with honey-dew. The six *years* of feeding and sleeping in darkness is followed by six *days* of happy flights in the air. Few of the tree-cutters look so striking as the male stag-beetle with his large mandibles. These have the appearance of stags' horns—hence the beetle's common name. The jaws are half as long as his body, and may occasionally be found one inch in length. With them he is well able to defend his home in the old oak-tree.

Scarcely a decayed giant of the woods can be found without a colony of wood-lice between the bark and the trunk. These insects do not bore, but sweep away the decayed particles of wood and make nice, snug homes for themselves where food is plentiful and safety sure. When disturbed, or when a piece of bark is stripped, they

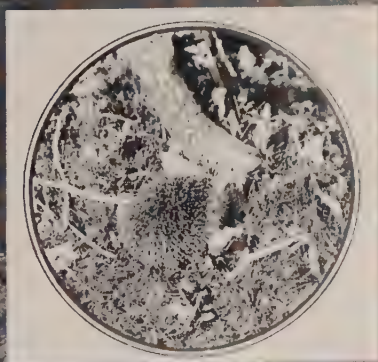
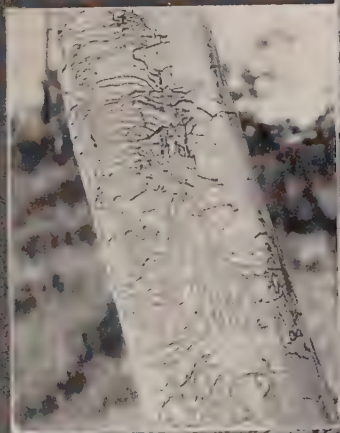
use their 10 to 20 limbs with great speed until hidden in a dark cavity.

Larvæ of the Goat Moth are tremendous borers. In the heart of a tree they work and scrape for three years until approaching the pupal stage. Then a large circular hole is made and lined with finest silk for the great change—to a perfect moth. The cavity is near the surface, and the goat-moth soon clears for the fresh air. But just imagine three years' darkness preparing for a few days of flight among the woodland flowers.

Among the fir-trees are deep furrows in several parts of the trunk. The Sirex fly comes along and selects the deepest of these furrows to make a deeper hole with her spear-like egg-layer or ovipositor. Here three eggs are laid, there two, in another place five, and so on, until quite a number are placed in the bark. The larvæ from these eggs bore into the trunk in all directions. It looks as if it had been riddled with bullets and could not possibly stand a winter's storm. The Sirex is sometimes mistaken for a wasp, which, in part, it much resembles. The ovipositor—hard, long and sharp—marks it, at once, as distinct from the wasp. The larvæ are fearful ravagers of pine woods.

In every woodland are to be found numerous burrowers in soil as well as in trees. Moles have a great liking for the quiet glade in the woods. Here they come into daylight without capture, or stroll about by night at pleasure. They dig deep and well into the turf, and make a comfortable home for their young two or three feet below the surface. The hind feet of the mole are broad, flat and powerful, while the fore claws are used in hewing down the soil right to the mouth of the burrow, where we find it heaped up into a 'mole-hill.' The burrows of a mole are very numerous; so that it is quite impossible to trace the animal by following one of its tunnels. The mole may be yards away from that track. One single mole covers an area of several square yards, and can easily get away if in danger of any sort. At or near the centre of its burrow a downy nest is completed to shelter five or six young ones. They do not see daylight with their tiny eyes until six or seven weeks old. The eyes of a full-grown mole are so small that they seem almost useless; and, as most of its time is spent underground in total darkness, the animal is not much concerned about eyesight.

Much smaller than moles are the mole-cricket which live in the soil of the woodland and make



SIREX FLY.
CHANNELS OF SCOLYTUS.

STAG-BEETLE.
HEDGEHOG SLEEPING NEAR HIS BURROW.
MOLE.

burrows after the same fashion as moles. They chirp like crickets—hence their name—and scoop out the soil with flat feet like moles. A cavity is hollowed near the surface to contain about a hundred dark-yellow eggs. These hatch out in a few days, if the sun is kindly disposed, and the small crickets set out in search of food. For several days they take ravenously to feeding. Mole-crickets are not easy to find; they are brown in colour, of various shades, and look like the soil in this respect.

May-fly larvæ abound in the banks of woodland streams, where they burrow about the water-line and form a U-shaped tunnel so that, if pursued by a wily foe at one end, they can escape into the water by the other opening. For three years these larvæ live in and about their burrows, gradually developing until the may-fly stage, with three long tails, is reached. The larva has large eyes and mouth and a fine array of side-gills, which, in the water, vibrate at a rapid rate. Very different is the winged fly with no gills, small head, sealed mouth, and small eyes. While the larval form swims and burrows for three years, the fly lives but one or two days at most.

Stung! and rather badly, too. We were hunt-

ing in the woods for a wood-wasp's nest. It could not be far away, as several sentinel wasps came from various holes in the ground around a common centre. All these apertures seemed to lead to the nest; but it was an awkward task to find the goal. We donned gloves, mittens, face-nets and took all care, as we thought, to find the nest without being stung. Alas! the wasps got the best of us, and by sheer numbers, beat us off. Where they all came from was a mystery. Instead of one, two, or three holes they came from twenty or more—and darted straight at the hunters. Stung, stung, stung—there was no getting away from the stinging unless the hunt was abandoned. We had had enough—the sting was painful. The order was given to retreat. So we did. But down below, a foot or two deep, was a wood-wasp's home, with a goodly company of tenants. From the swarm that surrounded us, we reckoned a few hundreds. There would be more inside the nesting-hole than we could see outside. These wood-wasps are very savage in the nesting-season, and will bear no interference with the channels leading to their home. The nest is formed of 'mashed' paper from tree-bark, sticks and roots, into six-sided cells, and arranged in tiers one above the other. As in

the case of bees, there are queens or females, drones or males, and workers or neuters. The workers tend the nest in all its details, feed the young larvæ that hatch from the eggs laid in the cells by the Queen wasp, and make the home clean, snug and happy. These were the insects that gave us the stings, and neither kid gloves nor net-masks will stop them. They mean business—every one in the swarm makes for the foe in attack.

A hard-working miner of the woods is the Humble Bee, whose hum is familiar to all ramblers on sunny summer days. We often find a few in the conservatory, but there they have gone astray somewhat, in search of honey among the sweet flowers. Ten to fifteen inches deep in the earth is the home of the Humble Bee, in a cavity 6 to 12 inches wide. There may be found from 150 to 200 oval eggs, clustered together, with waxen shells, as placed by the queens or female bees. The queens are at the head of the home and, after the first few days, they seem to order all its affairs. It is remarkable that when the first eggs are placed in the dark chamber, the workers or neuter bees devour them as rapidly as possible until they become fed up and helpless. Then the queens become mistresses of

the home, and the worker bees are compelled to obey orders. As soon as they have recovered from the effects of overfeeding, they begin to work and keep to their tasks properly. There is no further trouble, and the colony of humble bees grows in number and strength. Hatching takes place in 10 to 12 days; the young larvæ are tended with greatest care by the workers until they reach the pupal stage. Then they go to sleep. Waking up in due course—seven to ten days—they are very lively, and work bravely with the other bees to keep up the healthy condition of the whole swarm.

The wonder of all this burrowing and mining is that the work is carried on in total darkness; no daylight, no safety-lamp, no will-o'-the-wisp, no electric flash, no distant starlight—all is dark. Yet mistakes are few and seldom. Nature makes her own plans with the lowliest of her offspring, and all work together for the common good.

IX

WOODLAND ARCHITECTS AND BUILDERS

AMONG the highest architects in the woods are the magpies, which build their nests with great care, and erect an archway over the centre. How many nests they really build before house-keeping is hard to say. We observed, during one season, a couple of birds, and were not a little amused at their nest-building. These were two very fine birds, well up to the average size, and splendidly plumed from head to tail. For several days they hovered about the tallest trees as if not quite certain which would be most suitable. By night they settled on the top-most branches, and early in the morning were hopping about from branch to branch, occasionally taking a sweeping flight for a change in the field beyond, but returning to the lofty trees within an hour.

Then they began building what might become a nest. We could not tell yet. A few broken sticks appeared at an angle among the twigs; then

a few more somewhere else on the same tree. Still nothing was accomplished in the shape of a 'building.' After many more fitful flights these magpies evidently made up their minds to build. They set to work seriously, and really built a large nest. The finishing touch was put in the form of a neat arch, so that when completed the nest resembled a rough basket with a handle. Now we expected that the hen magpie would be keeping the eggs warm very shortly. But no. She was not much concerned about the matter, and took her flights at leisure with her mate into the fields or to a neighbouring wood.

All this seemed very curious—at nesting-time. But more was to follow. The nest so carefully built in the tall tree was left for hours, and then for days. Something had gone wrong. These discontented birds had forsaken their home, without any reason that was apparent. Although we kept watch on them carefully day after day, they were never seen to darken that home again. Another collection of sticks was in progress; some twenty yards away, on a still higher tree, we found them building another nest. As before, this was completed with a neat 'handle' to it, and looked more suitable than the first nest. But the magpies did not seem quite happy in this;

one evening, just as the sun was sinking in the west, they flew high in the heavens, and left the nest on which they had spent so much labour. It was never used for home-making. No eggs were ever placed in it.

Magpies are very wary and chary. They *do* settle on some tree-top after a while, and tend their eggs and brood with every care; but these places are, as far as possible, removed from human reach and ken.

Rooks are the blue-black denizens of most woods and forests. They fly high and low, revelling in space between the highest tree-tops and the lowest fields of corn and barley. Rooks 'caw, caw, caw,' and do a great deal of it. Assembling in flocks of one hundred to a thousand, they make rules of their own, and see to it that these are kept or severe punishment is sure to follow. One important rule of rook life is that all members of a colony must keep well together, both in flight and at nesting-time. When in the air, the birds generally do keep near each other; but when nesting the younger rooks will occasionally select a tree apart from the rookery. This cannot be allowed. A singular chattering goes on for a day or two, a sort of talk which none can understand outside the rooky

world. It certainly means something, and the rooks know that. After what must be called 'repeated warnings,' the older birds hover round the naughty rook's nest, swoop down upon it and tear it to pieces, stick from stick, as if to say 'don't do it again.' The lesson is quite sufficient for any other birds thinking of nesting apart. They dare not take the risk. Birds of the rookery have some faults. They like to visit the corn-fields just after sowing-time. They have also virtues: no bird in the wood or the hedgerow is more affectionate towards its young. A rook will fly very high at the sight of a man with a gun or a stick, but at brooding-time the worst enemy will not induce a rook to quit her young. The mother will suffer much rather than forsake them. A rook's nest does not show any great skill in building; indeed, it is rather clumsily put together with sticks of all shapes and sizes, and a lining of soft paper, grass and rags.

In the highest branches of the tallest woodland giants, far away from the haunts of men, may be seen the large well-built nests of the heron—a stately bird with long limbs, wide-spreading wings and a head tufted with graceful plumes. Herons love the quiet stream where they can bathe their broad feet in the fresh running water,



A ROOKERY.

NEST OF HEDGE SPARROW.

NEST OF COMMON THRUSH.

and occasionally make a dart at a small perch or trout. But for home-making and rearing their young, they soar aloft and desire to be left severely alone until the young herons are on the wing and well able to look after themselves. Frequently when these birds are discovered in the trees of a nobleman's park the utmost effort is made to give them full protection. When this concern is put into practice, the birds appreciate it and come to the locality year after year. It is really wonderful how the birds, after an absence of several months in lands a thousand miles away, return to the same woods, and to the same cluster of trees in the early spring.

A few tawny or brown owls are to be seen among the oaks and beeches in the autumn. Their nest-building is hidden in a hollow trunk where grass and straw are twined together and lined with soft down. Ring-doves abound among the larger trees and, at nesting-time, are to be heard cooing on every hand. They are poor nest-builders. Content with laying a few sticks across each other where two branches join, they form merely a curtain which can easily be seen from the ground below. The nest has two eggs only—as white as snow. If the Ring-dove did not attend well to her eggs and young, they would be

swept away by wind and rain. One or other of the parent birds remains 'at home' until the young are able to fly.

One of the best-constructed nests in the bushes of the woodland is that of the mistle-thrush—a lovely bird in its summer plumage. It is made of straw, grass and moss well knitted together, and is lined with a thin layer of hard, dry clay with hairs and pieces of fibre. The whole is neatly finished and placed in the fork of two branches. In this snug cavity four eggs, greenish-white with brown chestnut blotches, are laid early in the spring to hatch in May. Much time is spent by the parent birds in forming a nest that will hold well together until the young brood is on the wing. The song-thrush is not one wit less careful in nest-making, but forms the cavity of rougher material. Field refuse is used instead of clay, and rough sedge is common. The bird lays five or six eggs, blue and spotted black.

Blackbirds' nests are very numerous in most woods in May and June. They are solidly built of grass, straw, sedge, rags, cow-hair and mud, and so placed in the tree or bush that, when the bird is sitting, they are rainproof. The eggs are five in number, bluish-green with brownish-black spots and blotches. The Blackbird is one of the

earliest nest-builders and, making perfect use of its materials, it is almost covered over with a solid canopy when sitting on the nest. Woe betide any venturesome creature of small growth that should trespass on the home of the blackbird. On one occasion we noticed a stray cat from a neighbouring hamlet prowling near a large holly-bush. Of a certainty there was a blackbird's nest in that bush, and Pussy evidently knew about it. Nearer and nearer she ventured, crawling along the grass and sedge until within a few feet of the trunk of the tree. The parent birds were watching. Puss was not dangerous so long as she remained where she was. But she went nearer still, began to play her forepaws about the bottom of the trunk, and then attempted to climb. Now was the time for attack. The birds could bear it no longer. There came a sudden whistle, a sort of chatter, and a terrible squeal. The cat was beaten, severely beaten, and leaped away as fast as she could through the long grass. After the fearless attack in which they came off brave victors, the birds returned to the nest with its brood of five youngsters. The defence was bold and risky, but it saved the blackbirds' home.

We should like blackbirds much better if they

would keep to their usual food of insects; but they will look in at our orchards and gardens and pick our choicest pears, apples, plums and cherries. Fruit that is under-ripe or over-ripe is left severely alone. These birds like the best, and only the best. Thrushes behave much the same way in the autumn. During nesting-time, however, and especially during the time when the young birds are growing fast and get ravenously hungry, they prefer snails, slugs and worms. In the woods, snails and slugs are abundant. There are thousands on and about the grasses and fallen leaves, that make choice morsels for the young birds. We are aware that snails are covered with hard shells to protect them from harm. The thrush is not much troubled about this shell. She selects a stone or hard stump of a tree in a quiet part of the woods, and uses this as an anvil to break the shells. We found a stone which had been so used; it was littered with broken snail-shells. A thrush had been there many times, and was then not very far away with another snail in its beak. Slugs—black and brown—are picked from the grass and given piece-meal to the young bird. Worms have to be sought out: they are not seen when in the soil. The thrush has a wonderful knack of finding worms where

we could see nothing. She stalks cautiously under a tree where the dripping rain falls, and where the grass is not too thick, and listens carefully for any movement of worm's feet in the soil just below the surface. Ah! There you are. The thrush heard something move; down went the sharp beak and drew clean from the soil a big worm—a complete dinner for five hungry nestlings just before going to sleep.

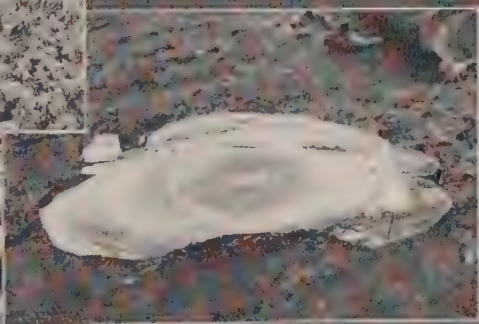
Coming to the fringe of the woods, we are sure to approach the snugly-built nest of the Hedge-Sparrow. The bird nests in bushes, such as the hawthorn copses, and the lowlier trees of the woodland. Nests are made early in the year of grass, mosses, wool, hair, hay and downy feathers. Five, or occasionally six eggs are laid. These are greenish-white, with spots and blotches of grey. The Hedge-Sparrow is a smart bird, well able to glide between the leaves and branches to an inner recess where her home and the safety of her young are assured.

X

JACK FROST IN THE WOODS

FEW scenes in Nature's wide realm are more beautiful than the woodlands in winter. When the birds are few and far asunder, a few robins flitting here and there in search of a sweet morsel, sparrows shooting about with a sharp shrill chirp among the higher branches of the trees, or a bevy of rooks flying overhead; when the world around seems half asleep, there is a grandeur quite unique in the vast carpet of snow, and the tree-trunks standing gaunt and bare against the interminable white.

The 'silently falling snow' is seen at its best in the woods. Millions of flakes gently fall and settle on the branches and in the grassy dells below, making the carpet thicker and thicker, until the snow covers everywhere to a depth of six to ten inches. The woodland stream tumbles along as usual, bearing away new waters and skimming the glassy banks with a fresh fringe of



'JACK FROST' ON THE TREES.

ANNUAL RINGS OF SYCAMORE.

THE WOODS UNDER SNOW.

ice. Then comes a piercing wind which sweeps through the woods and strips the trees of all their burden of snow in a few hours, leaving the frail tendrils and the lusty boughs black against the blue sky. All leaves are gone except those of the evergreens, such as the holly and privet. All blooms have vanished from the trees. The soil beneath sports a few beds of snowdrops dangling lovely flowers in the breeze. Primroses are sleeping and preparing for the brilliant outburst of colour in early spring. But, save for the song and twitter of birds, silence reigns supreme over the woods when Jack Frost comes on the scene.

As the sun sinks lower and lower in the west, day by day, the rays become longer and cooler until, some fine morning, we awake to find that Jack has been abroad during the night and covered the window panes with beautiful patterns in hoar-frost. The grass blades are fringed with icicles by the million, and every tree-branch is coated with glistening crystals. The air is cold, bracing and healthy. A thermometer placed against a tree shows the temperature to be below 32 degrees, and we say it is 'frosty.' The *still* waters of the woodland are hard, crisp and icy. Fishes, if any there were, have settled in the muddy bed, which is warmer. Frogs and toads

have gone into their wintry holes, and are sleeping till spring-time. They do not care for ice and snow, and seek out some snug cavity when Jack Frost first threatens. Pond-life does not cease in winter. The thousand microscopic creatures which flit about the water in summer-time are slowly hatching from eggs in the silt, and under stones. Great changes are going on throughout the coldest weather. When the ponds are filled with solid ice, these atoms of life are only sleeping—some in the ice itself.

Moles and hedgehogs are down below the level of the soil, quietly digging deeper and deeper as the cold becomes more intense. Seldom do they appear above ground in storm, hail and hurricane. Field-mice, of which many live in the woods, search out some sheltered cove, and scratch further under the soil where they can comfortably rest for three or four months. No small animals are to be seen abroad during the severest weather. Jack Frost is too hard upon them. They take the hint early, and get away from him as fast as they can. If a straggler should perchance venture 'out of doors,' we shall find it stiff and cold on the snow during one of our wintry rambles.

As the summer sun clothes the woods with green

leaves and flowers of every hue, so the frost and snow in winter keep the life of the trees in the trunks, boughs and roots, preparing new wood for fresh branches and leaves. Every year brings a new ring of wood to the trunk of a tree. Examine a tree-trunk that has recently been sawn across, and the age of the tree may be counted from the number of its rings. Those nearest the centre are the most recent and easiest to count. Near the bark they become confused and indistinct. From October to March, Jack Frost pays frequent visits to the woods. Days come and go when he is far away, and the trees send forth shoots of new life and promise, early buds and flowers. Then he comes again, blighting the plants which came too soon, and clothing all anew with a mantle of snow. Happily, in our country deep snow does not last long in the woods. There are days of warm sunshine, which readily melts the snow and fills the stream-beds with flood.

Weird and wild are the woods in a Christmas storm, when the winds whistle through the boughs and make music which is beyond the power of instruments to imitate. Wave after wave is blown fiercely among the forest giants, as their huge branches quail before the storm.

It is then that we learn something of the 'back-woods' of the Great North-West, where winds and storms are ever raging.

After the storm, the hurricane, the wintry blast, the frost and snow, there comes the calm sweet sunshine when the woodland dell and all its denizens are bright, cheery and beautiful. The flowery meads are beginning to blossom, leaf-buds are showing on the boughs. Early insects are basking in the sunbeams. Birds are flitting about with new life and vigour, singing new songs. Spring is coming. Jack Frost has retired, and the woods are bursting forth as they have done a thousand times before, to welcome the dawn of a new season—Spring-time.

Books and Media - P

£5.00

8 69693

KV-032-862